lightness of the surface, the effects of the transition metal elements on the low volume resistivity and low activation energy of temperature dependency of volume resistivity have not been confirmed.

It is possible to enlarge the sintering conditions (especially temperature range) as well as to give uniform appearance, by adding the transition metal element to lower the lightness of the surface. In short, it is possible to give uniform appearance without controlling the sintering temperature within 1775 to 1825 ℃.

The transition metal may preferably be Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Fe, Co or Ni, and most preferably be Ti, Mo or W.

The transition metal element may be added to raw powder of aluminum nitride as a metal alone. The metal element may be added as a metal compound such as a metal oxide, metal nitride, metal carbide, a sulfate, nitrate and an organic metal compound. Such metal compounds are compounds forming metal oxides upon heating (precursors for forming metal oxides). The metal or metal compound may be added as powder. Further, the metal compound may be dissolved into a solvent to obtain solution, which are then added to the raw powder of aluminum nitride.

The nitride of the transition metal may preferably be present in the sintered body with a low lightness. In this case, it is preferred that the nitride may be present mainly in intergranular phase or layer between aluminum nitride grains.

The aluminum nitride sintered body may preferably have a lightness of not higher than N4 defined in "JIS Z 8721" and thereby generate a high

quantity of heat radiation, thus providing excellent heating property. The sintered body may be useful for a substrate constituting a heating member such as a ceramic heater and susceptor.

The lightness will be described below. The surface color of a substance may be represented by three properties of color perception: hue, lightness and chroma. The lightness is a property for representing visual perception judging the reflectance of the surface of a substance. The representations of the three properties are defined in "JIS Z 8721". The representation of lightness will be briefly described. The lightness "V" is defined based on achromatic colors. The lightnesses of ideal black and ideal white are defined as "0" and "10", respectively. Achromatic colors between the ideal black and ideal white are divided into 10 categories and represented as symbols from "N0" to "N10". The categories are divided so that each category has a same rate or span in terms of visual perception of lightness. When actually measuring the lightness of an aluminum nitride sintered body, the surface color of the body is compared with standard color samples corresponding with "N0" to "N10" to determine the lightness of the body. The lightness is determined to the first decimal point, whose value is selected from "0" and "5".

In one preferred embodiment, the aluminum nitride sintered body contains at least 0.04 mole percent of samarium as a converted content as the oxide and further contains second rare earth element other than samarium. It is thereby possible to carry out fine adjustment (slightly increase) the volume resistivity of the sintered body of the invention. Such fine adjustment of the volume resistivity may be useful to shift the temperature range suited for the function of an electrostatic chuck to a higher temperature range. For example, it is provided that an electrostatic chuck may properly operate between room

temperature to 400 ℃ when the chuck is made of the inventive sintered body containing no second rare earth element. It is possible to control the temperature range for the proper operation of an electrostatic chuck within 60 to 500 ℃, by adding the second rare earth element to the body.

However, when the content of the second rare earth element is too large, the content of $SmAlO_3$ is increased and the content of $SmAl_{11}O_{18}$ is decreased in the intergranular phase, so that the formation of the network microstructure may be interrupted. This tends to cause the increase of volume resistivity and activation energy of temperature dependency of volume resistivity. For preventing the problems, the molar ratio of a converted content of the second rare earth element "Re" calculated as rare earth oxide "Re_2O_3" to a converted content of samarium calculated as samarium oxide (Re_2O_3 / Sm_2O_3) may preferably be not higher than 2.0. The ratio may more preferably be not higher than 1.5 and most preferably be not higher than 1.2.

For attaining the effect of the fine control of volume resistivity by the addition of the second rare earth element, the molar ratio of a converted content of the element "Re" calculated as "Re_2O_3" to a converted content of samarium calculated as the oxide (Re_2O_3 / Sm_2O_3) may preferably be not lower than 0.05 and more preferably be not lower than 0.1.

When adding the second rare earth element, the crystalline phase of the inventive sintered body is mainly composed of AlN phase and the phase of aluminum-samarium complex oxide. The complex oxide phase typically contains $SmAl_{11}O_{18}$ phase and $SmAlO_3$ phase. It is considered that the second rare earth elements are mainly dissolved into the complex